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Food Conservation
Through
Utilization of Garbage Waste

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CORRESPONDENCE STUDY

FOOD CONSERVATION THROUGH UTILIZATION OF GARBAGE WASTE

MADISON
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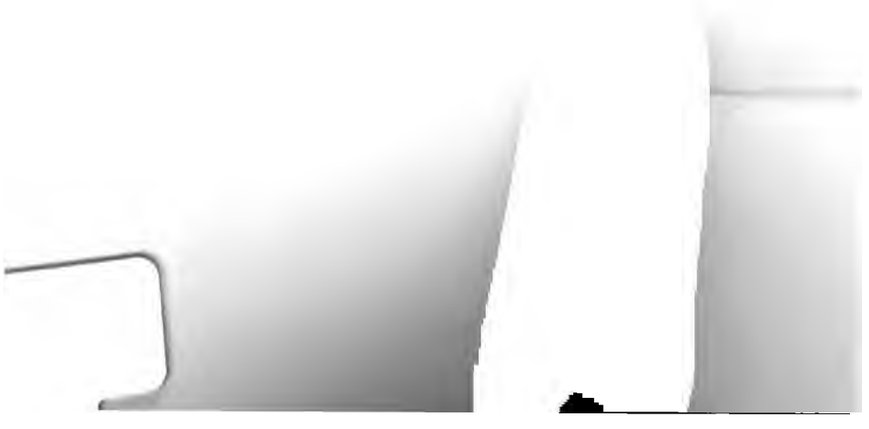
February, 1918

"We realize that in addition to the conservation of food there is great need of developing methods of utilizing inedible food-stuff, such as the garbage which accumulates daily in every household even when the strictest economy is exercised. Some of this material is now utilized but a large part is being wasted."—Herbert Hoover.

"As Food Administrator for the State of Wisconsin, I wish to call your attention to Mr. Hoover's appeal for more pork products. We ought not only to conserve the pork but we also ought to raise and feed as many hogs as possible, and in every way possible. All over the country, the garbage is largely wasted, and in this time of need, this should not be done."—Magnus Swenson.

"At this time of war when the conservation of food and the increase of production particularly of meats and fats is so important, much consideration should be given to the conservation and use of the waste products of the homes in cities. A tremendous food value is daily and annually going to waste through this source that has always been saved in European cities, and which should have been saved in this country as well. I have looked into the plans which you have submitted for conserving this food material and for feeding the same to swine, and I believe they will be very effective."—C. P. Norgord.



FOOD CONSERVATION

THROUGH UTILIZATION OF GARBAGE WASTE

by
G. R. BASCOM
In Charge of Municipal and Sanitary Engineering
and
DR. B. A. BEACH
Assistant Veterinarian, Agricultural Experiment Station

Food Crisis

That there is a world shortage of food supplies is now generally admitted. That the situation can be met is also quite certain, provided both the added production and the careful saving of food supplies are stimulated. People are responding to the appeals of the U. S. Food Administration to save foodstuffs, as is evidenced by the general adoption of meatless and wheatless days, the response of individual homes to appeals to cooperate, etc. The results of these efforts are already seen in a reduction in the amount of garbage wastes, which show a falling off of from 25 to 50 per cent.

Disposal Methods

The common methods of garbage disposal as practiced at present are: dumping, burying, burning, feeding, and reducing. By special processes garbage is also utilized in the making of alcohol, as at the Municipal Plant at Cleveland, Ohio. None of these methods should be used at this time except those which in some way utilize the garbage.

Garbage Burning

The burning is usually carried on in a manner which represents a direct net expense even where the steam is utilized.

This is illustrated in the Minneapolis plant where the city engineer advises closing the plant and feeding the garbage. Burner manufacturers generally offer to burn mixed refuse (garbage and trash) if there is available not less than 40 to 45 per cent combustible refuse (exclusive of ashes). It can readily be seen that in the northern states there will not be available any such percentage of combustible refuse, since people burn this material in the furnaces, small water heaters, and cook stoves. As a result, garbage burning in the northern cities is almost universally a costly process, and at this time of a national coal shortage should be discontinued, if at all possible.

Reduction

There are some cities for which, in peace times, the best method of disposal would possibly be that of reduction, where the garbage is digested under steam pressure to take off the fats. The tankage thus made is generally used as a fertilizer, but research work under way at present indicates a strong possibility of successfully utilizing the tankage as hog feed.

As a war measure the installation of a garbage reduction plant would be questionable because of the elements of time and first cost. Feeding direct to swine offers a quicker solution as an emergency.

It should further be stated that a garbage reduction plant cannot be profitably operated on a basis of less than five tons of raw garbage a day, and some engineers place this minimum tonnage at a higher figure. It is evident, therefore, that only in the fairly good-sized city would garbage reduction be economically possible unless it is definitely demonstrated that the tankage can be used as a stock food.

Garbage Wastes

In spite of all we can do there will necessarily be some garbage wastes which in the aggregate amount to a large tonnage. When it is known that the average garbage produced by 45 people will put 200 pounds on a hog in 5 months without any added feed, some little idea can be had of the value of garbage as a hog food.

Garbage Feeding

There is nothing new in the plan of feeding garbage to swine. In fact it was the prevailing system of garbage disposal thirty years ago and is today in some sections of the United States. Like the other sanitary problems it has been badly handled so that the general public today looks with suspicion upon this method of disposal. However, the consensus of opinion among unbiased sanitary engineers and garbage disposal experts is that garbage can be and is being fed in a sanitary manner, without danger to public health, and at a very distinct profit.

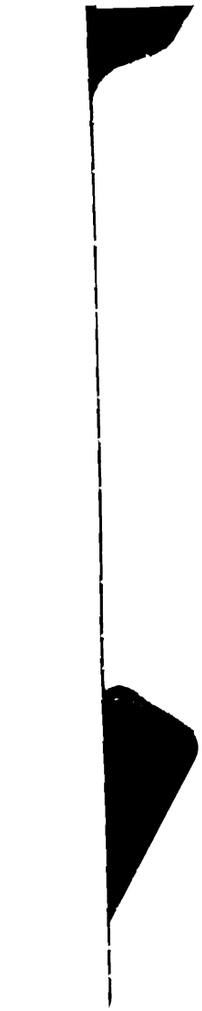
Wisconsin Wastes

Applying the garbage wastes to our own State of Wisconsin, let us see what we could accomplish were a concentrated effort made to utilize them. Hogs are quoted at $17.50 per 100 pounds on foot at present, so that a gain of 200 pounds represents a saving of $35 per hog as fed on the garbage produced by 45 people.

In Wisconsin cities having a population of 1,000 or more there is produced enough garbage to fatten more than 50,000 hogs annually. In gross returns this means an annual income of approximately $2,000,000 if properly conserved. Just how much of this saving can be effected is problematical, but it is thought possible to save half of this enormous waste if the proper attempt is made.

In most places only a portion of the total garbage waste is collected. Prior to the war the average collected in American cities was less than 40 per cent. The right system of collections will get practically all the garbage.

In addition to the above loss there are a number of cities in Wisconsin that are buring the garbage, thus adding to the grand total of losses. In unusual times such as these it should be the patriotic duty of city officials to cut down on every possible waste, and especially on those commodities for which at present the demand is greater than the supply. It is undoubtedly certain that the saving in coal now used to burn garbage in the average burner in this state would more than pay the interest on the investment needed to finance an Emergency Garbage Feeding Station.



Objections to Garbage Feeding

The feeding of garbage has been unduly condemned for the following reasons:

(a) There is a popular belief that the feeding of garbage endangers the public health. This belief is not founded on the facts. It should be stated that, contrary to popular belief, human diseases are in all probability not transmitted through garbage feeding. The sanitary problem, then, concerns not so much the health of man as the health of the hog.

(b) Garbage feeding plants have in the past been pretty generally mismanaged from a sanitary standpoint, but the system should not be condemned on this account. Garbage feeding plants can be made sanitary. Many cities in the United States are now successfully feeding garbage to swine without injury to the public health. More than 90 per cent of all the hogs raised in the State of Massachusetts are garbage fed, and the Massachusetts State Board of Health is most efficient, at all times demanding the best results.

(c) The hog has been generally condemned as a filth-loving animal. This is far from fair to the hog who is naturally a tidy animal. Owing to the fact that a hog perspires only on a very few spots on his body and that he is overfed to force fattening, quite naturally he becomes hot and seeks the handiest place available to cool off. If the proper place is provided for wallowing, and plenty of shade is at hand, the hog will keep clean. It is true that the conditions under which some pigs have been fed and fattened have been not only a disgrace to the community but decidedly unfair to the hog.

(d) Complaints of the bad odors have been made against garbage feeding piggeries, yet where proper precautions are taken there is no more objection to feeding garbage than to feeding grain or other hog food.

Preventable Losses

In the past, many garbage fed hogs have died from indigestion, due to strong alkalies in the feed and to hog cholera contracted from eating scraps of infected raw pork. The first of these diseases can be effectively eliminated by enacting an ordinance to prohibit putting strong chemical substances such as soap powders, lye, etc., in the garbage cans. Such ordinances are now effectively enforced in many cities.

Hog cholera can be controlled by keeping all hogs immune to this destructive disease by vaccinating them with anti-hog-cholera serum. When hogs are properly treated, statistics show that the losses are less than 2 per cent as an average. City officials should refuse to sell garbage to feeders who do not vaccinate and at all times use the best methods of keeping the herds immune.

Profits

The reports of piggeries in which garbage has been used for feed show that the average table waste from about 45 people is sufficient to produce 200 pounds of pork. Thus a city of 50,000 should produce enough garbage to fatten 1,000 hogs every 5 months. When one stops to consider that the present market price of hogs is 17½ cents a pound, and that 37½ pounds of average garbage will put about a pound a day on the hog, he can see that there are large returns available in properly conducted piggeries.

Garbage-Fed Pork

The consensus of opinion of both the packers and hog feeders is that the difference between pork as produced on the garbage-fed hog and on the grain-fed hog is so slight that it is practically impossible to discover it. Where the packer does not know what has been fed, the garbage-fed hog will top the market quite as frequently as the grain-fed hog.

It is further quite generally recognized that garbage-fed hogs will not dress out as high a percentage as grain-fed hogs, doubtless owing to the fact that the digestive apparatus of the garbage-fed hog contains a much larger quantity of waste material.

It is further of interest to know that in a recent shipment of about 100,000 pounds of pork from the garbage feeding station at Worcester, Mass., only 40 pounds were rejected. The hog is a great sorting machine, and if fed raw garbage will almost always select only the edible portions.

It should be noted that at this time the cost of hogs is so high and the supply so limited that difficulty in securing a new herd will no doubt be met. However there are many grain-fed hogs on nearby farms which can be fed garbage, thus con-

serving the grain foods and utilizing garbage wastes. Further, no one should imagine he can start and operate a garbage feeding station or even feed garbage to a few hogs without great losses, if he refuses to immunize his herd.

Cost of Plant

The cost of establishing a piggery and conducting it on a scientific basis depends so primarily upon local conditions that even generalities and estimated costs are of little value. However, a fully equipped and properly constructed plant for 500 hogs can be built for about $4,000.

Caution

Any municipality or individual who plans to utilize garbage in the feeding of hogs must constantly bear in mind that to maintain an establishment of this kind without creating a nuisance, the plant must first be properly located, and secondly, properly cared for at all times.

The state law provides that whenever a nuisance shall be found on private or public property, it must be abated. The State Board of Health and the local boards of health have full authority to abate such nuisances.

Therefore if the feeding of garbage is undertaken, it **must** be done in a proper location and under adequate supervision at all times. The services of an expert should be sought in every case when new plants are installed. There are many garbage-feeding plants throughout the state which are conducted in such a manner as to raise no objection whatever, whereas in a number of other localities it has been necessary to order the business discontinued on account of the nuisance created.

Selling Garbage

In many cases it will no doubt be better to sell the garbage direct to licensed farmers. This can be arranged by the city making its own collections and hauling the garbage to a conveniently located transfer or loading bin. The loading station should be so designed as to make it possible to keep it in a sanitary condition and to make loading and unloading economical. An attendant should be in charge of the loading

station at all times so that a record of the garbage sold may be properly kept. He should be held responsible for the sanitary conditions at the transfer station.

This plan will be especially effective in the solution of the garbage problem of the smaller cities, and in fact a plan worthy of consideration in most cities, since it can be quickly and cheaply installed and does not demand the services of experts who are most essential in the effective operation of a community piggery.

Where to Feed

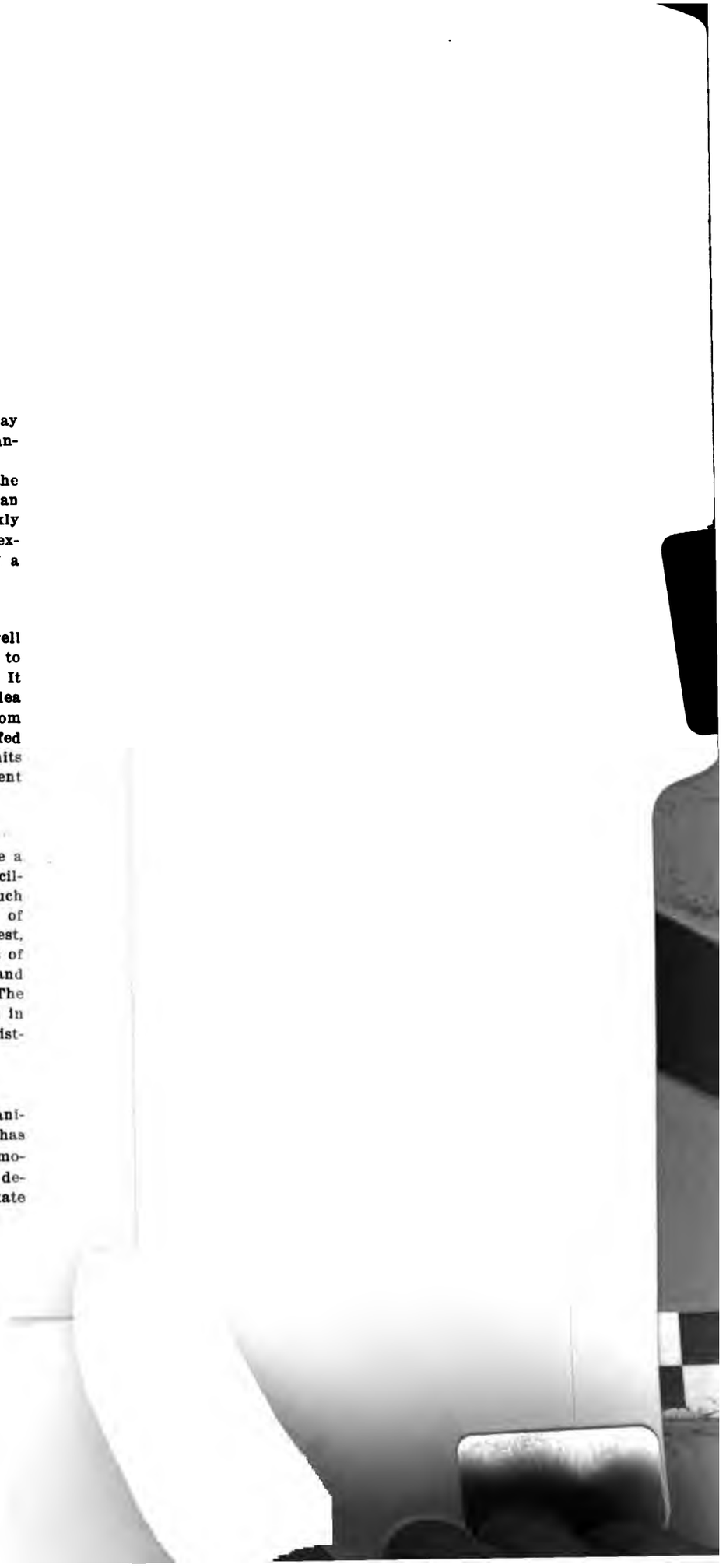
The garbage feeding should be carried on either at a well located piggery outside the city limits and on land suited to the purpose or on certain farms outside the city limits. It is not intended to convey the idea that the "keep a hog" idea is urged on the town people. Nothing could be further from the purpose of this bulletin. Hogs in no case should be fed inside the city limits, and where fed outside the city limits the stations should be so located and conducted as to prevent complaints.

Duty of Councilmen

When a city is so situated that it can erect and operate a garbage feeding piggery, it should be the duty of its councilmen to investigate the local possibilities. To aid them in such an investigation, the Extension Division and the College of Agriculture of the University of Wisconsin will, on request, gladly send out experts to advise relative to the questions of location and operation of the plant, garbage collection, and the control of hog cholera and other diseases of hogs. The University considers this a matter of supreme importance in this time of a world food shortage, and is justified in assisting to the limit in every way possible.

Wisconsin Officials Approve

It will be interesting to know that the Municipal and Sanitary Engineering Department of the Extension Division has been trying to initiate a state-wide campaign for the promotion of the plan of garbage feeding. It has been slow in developing, until within the past two months, when every state



agency interested has been won over to the cause. The State Council of Defense, the Commissioner of Agriculture, the State Board of Health, the Veterinarian of the College of Agriculture, and Professor Bascom met in conference not long ago and agreed to try the plan.

Hoover Approves

The U. S. Department of Agriculture and the U. S. Food Commission are also active in working out a plan for the promotion of a national campaign for garbage feeding. That the best plan might be effected Mr. Hoover recently called a meeting of experts in every phase of the garbage disposal problem. The findings and opinions of these men as expressed at the conference were carefully recorded, and from the notes and further follow-up studies a plan of campaign for helping every city in the United States will be worked out. The plan as adopted for Wisconsin was presented by Professor Bascom. A central organization at Washington will be formed to direct the work and will be assisted by State Agents, State and County Councils of Defense, Commercial Clubs, etc. In fact the whole machinery of the U. S. Food Commission and its endless group of workers will be put in motion at an early date to bring about the effective utilization of garbage.

Our Opportunity

A plan which will meet Wisconsin conditions has been adopted. It has the approval of the state authorities. The Federal Government is back of the movement and calling on everyone to assist in doing a wonderful work in food conservation. Never in the history of this country was there such an opportune time to promote the effective utilization of garbage wastes. Let no time be lost in making the best of the opportunity—let Wisconsin be the first state in the Union to undertake this work in a big way.

EXTENSION DIVISION PUBLICATIONS

Emergency Bulletins and Folders

The following bulletins and leaflets will be sent free on request to residents of Wisconsin.

The Great War
(A study outline of the causes, the immediate background, and the beginnings of the Great World War, by Prof. W. J. Chase.)

The Desirability of Vocational Education and Direction for Disabled Soldiers
(A bulleting by Elizabeth C. Upham treating of the great problems of the industrial readjustment of the wounded.)

Food Conservation Through Utilization of Garbage Wastes
(A bulletin discussing the feasibility of saving one of the nation's great wastes.)

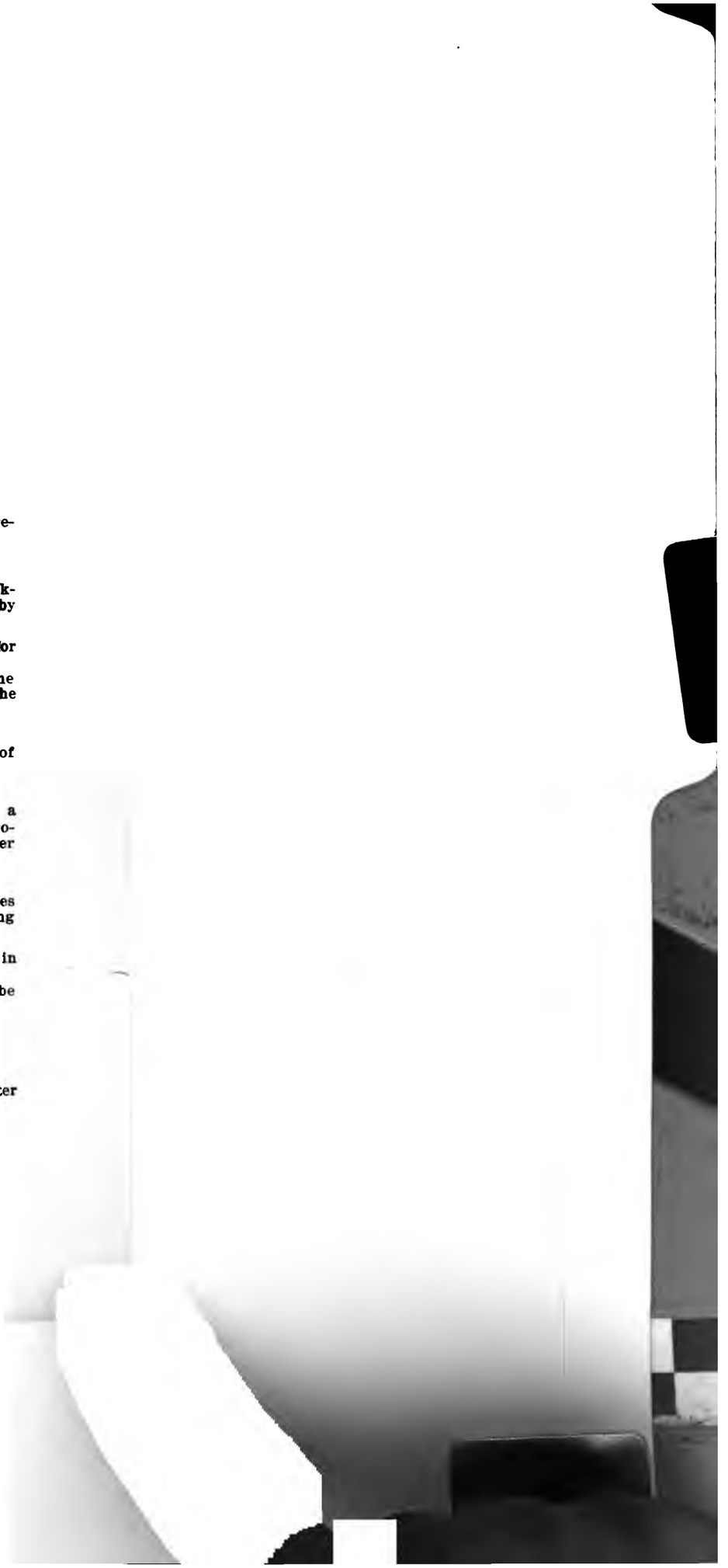
Triangular Discussion League—American Song Contest
(A bulletin setting forth methods of organization of a league for the discussion of topics of the day, with programs suggested; also presenting the objects and manner of conducting song contests as stimuli to patriotism.)

The Light of History and the Great War
(A folder presenting the outline of ten class lectures given by Prof. Victor Coffin, interpreting and explaining the war in the light of modern history.)

Saving Fuel in the Operation of Hot Air Heating Plants in Homes
(A folder giving information and general rules to be followed.)

Conservation of Fuel in Hand-Fired Power Plants
(A folder of information and instruction.)

Practical Hand Firing
(A folder on a course designed to save coal by better firing in power plants.)



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